

Claims:

1. A liquid electrophotographic toner composition comprising:

- a) a liquid carrier having a Kauri-butanol number less than 30 mL; and
- b) a plurality of toner particles dispersed in the liquid carrier, wherein the toner particles comprise polymeric binder comprising at least one amphipathic copolymer comprising one or more S material portions and one or more D material portions, wherein the S material portion of the copolymer has molecular weight and solubility properties selected to provide a three dimensional gel of controlled rigidity which can be reversibly reduced to a fluid state by application of energy; and wherein the electrophotographic toner composition does not form a film under Photoreceptor Image Formation conditions.

2. The liquid electrophotographic toner composition according to claim 1, wherein the absolute Hildebrand solubility parameter difference between the S material portion of the amphipathic copolymer and the carrier liquid is between 2.4 and 3.0 MPa^{1/2}.

3. The liquid electrophotographic toner composition according to claim 1, wherein the S material portion of the amphipathic copolymer has a molecular weight of greater than about 200,000 Daltons.

4. The liquid electrophotographic toner composition according to claim 1, wherein the S material portion of the amphipathic copolymer has a molecular weight of greater than about 300,000 Daltons.

5. The liquid electrophotographic toner composition according to claim 1, wherein the S material portion of the amphipathic copolymer has a molecular weight of greater than about 400,000 Daltons.

6. The liquid electrophotographic toner composition according to claim 1, wherein the S material portion of the amphipathic copolymer has a molecular weight of from about 400,000 to about 800,000 Daltons.

7. The liquid electrophotographic toner composition according to claim 1, wherein the D material portion of the amphipathic copolymer has a total calculated T_g greater than or equal to about 30°C.
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8. The liquid electrophotographic toner composition according to claim 1, wherein the D material portion of the amphipathic copolymer has a total calculated T_g of from about 50-60°C.
- 10 9. The liquid electrophotographic toner composition according to claim 1, wherein the amphipathic copolymer has a total calculated T_g greater than or equal to about 30°C.
10. The liquid electrophotographic toner composition according to claim 1, wherein the amphipathic copolymer has a total calculated T_g greater than about 55°C.
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11. The liquid electrophotographic toner composition according to claim 1, the toner particle comprising at least one visual enhancement additive.
12. A method of making a liquid electrophotographic toner composition, comprising
20 the steps of:
- a) providing a plurality of free radically polymerizable monomers, wherein at least one of the monomers comprises a first reactive functionality;
 - b) free radically polymerizing the monomers in a solvent to form a first reactive functional polymer having a predetermined molecular weight and solubility
- 25 parameter, wherein the monomers and the hydroxyl functional polymer are soluble in the solvent;
- c) reacting a compound having a second reactive functionality that is reactive with the first reactive functionality and free radically polymerizable functionality with the first reactive functional polymer under conditions such that at least a portion of the second reactive functionality of the compound reacts with at least a portion of the first reactive functionality of the polymer to form one or more linkages by which the
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compound is linked to the polymer, thereby providing an S material portion polymer with pendant free radically polymerizable functionality;

d) copolymerizing ingredients comprising (i) the S material portion polymer with pendant free radically polymerizable functionality, (ii) one or more free radically polymerizable monomers, and (iii) a liquid carrier in which polymeric material derived from ingredients comprising the one or more additional monomers of ingredient (ii) is insoluble;

said copolymerizing occurring under conditions effective to form an amphipathic copolymer having S and D portions, the S material portions having molecular weight and solubility properties selected to provide a three dimensional gel of controlled rigidity which can be reversibly reduced to a fluid state by application of energy; and wherein the electrophotographic toner composition does not form a film under Photoreceptor Image Formation conditions.

13. The method of claim 12, wherein the first reactive functionality is selected from hydroxyl and amine functionalities, and the second reactive functionality is selected from isocyanate and epoxy functionalities.

14. The method of claim 12, wherein the first reactive functionality is a hydroxyl functionality, and the second reactive functionality is an isocyanate functionality.

15. The method of claim 12, wherein the first reactive functionality is selected from isocyanate and epoxy functionalities, and the second reactive functionality is selected from hydroxyl and amine functionalities.

16. A method of electrophotographically forming an image on a substrate surface comprising steps of:

- a) providing a liquid toner composition of claim 1;
- b) causing an image comprising the toner particles in a carrier liquid to be formed on a surface of a photoreceptor; and

c) transferring the image from the surface of the photoconductor to an intermediate transfer material or directly to a print medium without film formation on the photoreceptor.